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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/331,723	08/18/1999	JOHN E. BOYNTON	2185-156PCT	2008

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EXAMINER
MEHTA, ASHWIN D

ART UNIT	PAPER NUMBER
1638	29

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/331,723	BOYNTON ET AL.	
	Examiner	Art Unit	
	Ashwin Mehta	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 October 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4,6,7,10-16,18 and 20-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,6,7,10-16,18 and 20-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Request for Continued Examination

1. The transmittal filed on 09 October 2002 for a Request for Continued Examination (RCE) under 37 CFR 1.114 based on parent Application No. 09/331,723 is acceptable and a RCE has been established. An action on the RCE follows.

2. The claim amendments received 05 July 2002 have been entered.

3. The objection to claims 1, 2, 4, 7, 10-16, 18, 21, and 24, and the objection to claim 7, have been withdrawn, in light of the claim amendments.

4. The rejection of claims 1, 2, 4, 6, 7, 10-16, 18, 20-24, 41, and 42 are withdrawn, in light of the claim amendments or cancellations.

Claim Objections

5. Claims 13 and 22 are objected.

Claim 13 is objected to for not properly referring to the claim from which it depends. It is suggested that the recitation "non-resistant plants" in lines 1-2 be replaced with --plants lacking resistance to protoporphyrinogen-inhibiting herbicides--.

In claim 22: the term --is-- should be inserted in line 6 before "replaced".

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 2, 4, 6, 7, 10-16, 18, 20-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 15: the term "an" in the recitation "nucleotide sequence encoding an amino acid sequence of SEQ ID NO: 1" in lines 10-11 of claim 1 and lines 7-8 of claim 15 render the claims indefinite. It is not clear if the nucleotide sequence encodes all of SEQ ID NO: 1, or any sequence within SEQ ID NO: 1. It is suggested that the term "an" in the recitation be replaced with --the--.

Further in claims 1 and 15: the recitation "an amino acid corresponding to Val13 in SEQ ID NO: 1" in part (3) of the claims renders the claims indefinite. The term "an" suggests that the part of the protein comprises more than one amino acid that can correspond to Val13. The claim does not clearly indicate if the part of the protein contains only one or more than one such amino acid.

In claims 1, 7, 15, and 22: the recitation "corresponding to" in line 17 of claim 1, line 2 of claim 7, line 14 of claim 15, and line 5 of claim 22 renders the claims indefinite. It is not exactly clear what is meant by this recitation. For example, is the "corresponding" amino acid valine, or some other amino acid, and is it residue 13? Is the "corresponding" nucleotide also guanine, and is it also position 37?

In claim 6: the recitation "wherein said protein has protoporphyrinogen oxidase activity in Chlamydomonas" renders the claim indefinite. It is not clear if the recitation is indicating that the protein is a Chlamydomonas protein.

In claim 22: the recitation "the DNA fragment encodes a protein" renders the claim indefinite. The recitation broadens, rather than limits, the scope of parent claim 20, which is drawn to an isolated DNA fragment encoding a part of a protein.

Further in claim 22: the recitation "can be isolated from" also renders the claim indefinite. It is not clear whether or not the DNA fragment is isolated from Chlamydomonas. It is suggested that "has a sequence that can be" be replaced with --is--.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1, 2, 4, 6, 7, 10-16, 18, and 20-24 remain rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention, for the reasons of record stated in the Office actions mailed 22 July 2002, 09 April 2002, and 14 August 2001. Applicants traverse the rejection in the paper received 09 October 2002. Applicants' arguments have been fully considered but were not found persuasive.

The claims are broadly drawn towards an isolated DNA fragment wherein said DNA fragment encodes a part of a protein, wherein said protein has protoporphyrinogen oxidase (PPO) activity in plants, and has a sequence that can be detected and isolated by DNA-DNA or DNA-RNA hybridization to any nucleic acid sequence that is complementary to a nucleotide sequence encoding SEQ ID NO: 1, and encodes the part of said protein in which the amino acid corresponding to Val13 of SEQ ID NO: 1 is substituted by another amino acid, and said DNA fragment has the ability to confer resistance to protoporphyrinogen-inhibiting herbicides in a plant or algal cells; or wherein said DNA fragment encodes a protein or part thereof having PPO activity in a dicot or monocot; or wherein said plant is *Chlamydomonas* and the DNA fragment encodes an amino acid sequence resulting from replacement of Val13 with any other amino acid sequence; or wherein said amino acid is methionine; or said DNA fragment is genomic DNA isolated from *Chlamydomonas*, the DNA fragment encodes a protein or a part of a protein wherein the protein has PPO activity, and a nucleotide corresponding to G37 in SEQ ID NO: 4 is replaced with another nucleotide; or wherein said nucleotide is adenine; or a plasmid comprising said DNA fragment; or a method of conferring resistance to PPO-inhibiting herbicides upon plants or plant cells, comprising introducing said DNA fragment into plants or plant cells and said DNA fragment has the ability to confer resistance to PPO-inhibiting herbicides in plant or algal cells when expressed therein; or said method the plant is a dicot, or a monocot, or *Chlamydomonas*; or a plant or plant cells or green alga upon which resistance is conferred according to said method; a method of selecting plant or algal cells upon which resistance is conferred according to said method; a method of controlling cells lacking resistance to PPO-

inhibiting herbicides, comprising cultivated fields of plants produced according to said method of conferring resistance.

Pages 39-51, Examples 5 and 7, of the specification describe the isolation of a genomic clone, COS-2955, of a mutant PPO gene from a *Chlamydomonas* strain that is resistant to PPO-inhibiting herbicides, while retaining PPO activity (pages 39-51, Examples 5 and 7, page 53, Example 9). Complementation assays conducted with restriction fragments from this clone determined that a HindIII fragment (Hind10.0) conferred PPO-herbicide resistance to a herbicide-sensitive *Chlamydomonas* strain (Example 7). Further analysis revealed that an Xho-PmaCI fragment (Xho/PmaC2.6, SEQ ID NO: 10) within the Hind10.0 fragment was the smallest fragment to complement the herbicide-sensitive strain. The exon domains within the Xho/PmaC2.6 fragment were determined based on comparison to the *Arabidopsis* Protox (an acronym for protoporphyrinogen oxidase) cDNA clone (page 55). Comparison of the exon sequences with the corresponding sequences from the wild-type *Chlamydomonas* clone revealed a base change in exon 1 (page 56). SEQ ID NO: 4 is the base sequence of this exon in the wild-type clone (and encodes SEQ ID NO: 1). In the PPO-inhibiting herbicide resistant mutant, guanine 37 of this exon is changed to adenine. This results in a change of Val 13 of SEQ ID NO: 1 to Met (pages 55-57, Example 11).

Though the Xho/PmaC2.6 fragment conferred herbicide resistance to a herbicide sensitive *Chlamydomonas* strain, it does not contain the entire gene. Randolph-Anderson et al. (Plant Mol. Biol., 1998, Vol. 38, pages 839-859) describe the isolation of the clones described in the instant specification, and the isolation of a cDNA that contains the full-length coding region of the *Chlamydomonas* PPO gene (pages 848-851). Randolph-Anderson et al. indicate that the

guanine to adenine base change occurs in exon 10 of the full-length clone, corresponding to a change of Val 389 to Met in the encoded protein (page 851). While the specification does not provide the nucleotide sequence of the full-length genomic clone of the *Chlamydomonas* mutant PPO gene, it describes the isolation of a DNA fragment, Hind10.0, which contains the genomic clone. The specification also indicates that the DNA fragment, Xho/PmaC2.6, encodes a portion of the PPO gene, but is also sufficient to confer PPO-inhibiting herbicide resistance when introduced into a herbicide-sensitive *Chlamydomonas* strain. However, as the amino acid sequence of the full length *Chlamydomonas* PPO protein is not described, one cannot make a structure/function correlation with the amino acid sequence of the protein that comprises the sequence that is encoded by the hybridizing sequence. That is, while the amino acid sequence encoded by the Xho/PmaC2.6 fragment that confers herbicide resistance is known (SEQ ID NO: 1 wherein a methionine is substituted for valine 13), the amino acid sequence of the entire mutant Chlamydomonas protein that has PPO activity and that confers resistance to PPO-inhibiting herbicides is not described. Therefore, a correlation between the structure of the full protein that comprises SEQ ID NO: 1 with the methionine substitution for Val13, with its properties of PPO activity and ability to confer resistance to PPO-inhibiting herbicides has not been made. One then cannot establish the correlation for the protein that comprises the "part of a protein" encoded by the claimed DNA fragments that hybridize to SEQ ID NO: 1. One needs to make this correlation, since the full-length protein needs to have the PPO activity of the Chlamydomonas protein that comprises SEQ ID NO: 1. Still, one cannot know if the protein, that comprises the portion that is encoded by the fragment that hybridizes to the sequence encoding SEQ ID NO: 1, shares the same structure-function correlation as the Chlamydomonas

protein that comprises the amino acid sequence encoded by the Xho/Pmac2.6 fragment, since the amino acid sequence of that latter protein is not described.

Further, in the absence of the entire protein sequence that comprises the "part of the protein," the correlation of the "amino acid corresponding to Val13 of SEQ ID NO: 1" cannot be made, since one cannot determine if the intact protein has the PPO activity of the Chlamydomonas protein that comprises SEQ ID NO: 1. No other structural changes to SEQ ID NO: 1 or the protein comprising SEQ ID NO: 1 are correlated to the functional property of conferring PPO-herbicide resistance, while still retaining PPO activity. Also see Fiers vs. Sugarno, 25 USPQ 2d (CAFC 1993) at 1606, which states that "[a]n adequate written description of a DNA requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it; what is required is a description of the DNA itself". Given the breadth of the claims encompassing any DNA fragment encoding a part of a protein having PPO activity, and sequences which hybridize to sequences encoding SEQ ID NO: 1, and which encode any protein in which a valine residue corresponding to Val13 of SEQ ID NO: 1 is changed to another amino acid, and the lack of written description as discussed above, the specification fails to provide an adequate written description of the multitude of DNA fragments encompassed by the claims.

Applicants argue that they have described the claimed DNA fragment, including the hybridization conditions shown to have worked in the present invention (response, paragraph bridging pages 2-3). However, the only DNA fragments described by the specification are those encoding SEQ ID NO: 1, wherein Val13 has been substituted by Met. Further, it is noted that the hybridization conditions recited in the claims are incomplete, as the temperature of the wash

is not provided. It is well known in the art that wash temperatures that do not correspond to high stringency conditions allow the hybridization of sequences that are unrelated to a template sequence. Even still, the amino acid sequence encoded by the hybridizing fragment itself would not encode PPO activity, as it would only be a part of a protein.

8. Claims 1, 2, 4, 6, 7, 10-16, 18, and 20-24 remain rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention, for the reasons of record stated in the Office actions mailed 22 July 2002, 09 April 2002, and 14 August 2001. Applicants traverse the rejection in the paper received 09 October 2002. Applicants' arguments have been fully considered but were not found persuasive.

The claims are broadly drawn towards an isolated DNA fragment wherein said DNA fragment encodes a part of a protein, wherein said protein has protoporphyrinogen oxidase (PPO) activity in plants, and has a sequence that can be detected and isolated by DNA-DNA or DNA-RNA hybridization to any nucleic acid sequence that is complementary to a nucleotide sequence encoding SEQ ID NO: 1, and encodes the part of said protein in which the amino acid corresponding to Val13 of SEQ ID NO: 1 is substituted by another amino acid, and said DNA fragment has the ability to confer resistance to protoporphyrinogen-inhibiting herbicides in a plant or algal cells; or wherein said DNA fragment encodes a protein or part thereof having PPO activity in a dicot or monocot; or wherein said plant is *Chlamydomonas* and the DNA fragment encodes an amino acid sequence resulting from replacement of Val13 with any other amino acid

sequence; or wherein said amino acid is methionine; or said DNA fragment is genomic DNA isolated from *Chlamydomonas*, the DNA fragment encodes a protein or a part of a protein wherein the protein has PPO activity, and a nucleotide corresponding to G37 in SEQ ID NO: 4 is replaced with another nucleotide; or wherein said nucleotide is adenine; or a plasmid comprising said DNA fragment; or a method of conferring resistance to PPO-inhibiting herbicides upon plants or plant cells, comprising introducing said DNA fragment into plants or plant cells and said DNA fragment has the ability to confer resistance to PPO-inhibiting herbicides in plant or algal cells when expressed therein; or said method the plant is a dicot, or a monocot, or *Chlamydomonas*; or a plant or plant cells or green alga upon which resistance is conferred according to said method; a method of selecting plant or algal cells upon which resistance is conferred according to said method; a method of controlling cells lacking resistance to PPO-inhibiting herbicides, comprising cultivated fields of

The specification teaches the isolation of a genomic clone from *Chlamydomonas* that encodes a mutant PPO protein that confers resistance to PPO-inhibiting herbicides while still retaining PPO activity, as discussed above. The specification also teaches a DNA fragment, Xho/PmaC2.6, of the clone that also confers herbicide resistance to herbicide sensitive Chlamydomonas strains, also as discussed above. The wild-type sequence corresponding to the first exon in the Xho/PmaC2.6 fragment is set forth in SEQ ID NO: 4, which encodes SEQ ID NO: 1. The portion of the PPO gene within the Xho/PmaC2.6 fragment contains a base change of guanine 37 in SEQ ID NO: 4 to adenine, which results in an amino acid change of Val to Met in the mutant protein (page 55, line 1 to page 56, line 33).

However, the Xho/PmaC2.6 fragment contains only a portion of the mutant gene, and does not encode the full protein (as discussed above). The claimed DNA fragment itself does not identify the gene that it came from as one that encodes a protein having PPO activity. The specification does not enable any gene that comprises the claimed DNA fragment, nor the protein that comprises the sequence encoded by the DNA fragment. Further, it is not clear how one can correctly identify the amino acid sequence corresponding to Val13 of SEQ ID NO: 1, in the amino acid sequence encoded by the claimed DNA fragment, is the correct residue if the entire nucleotide coding sequence or protein sequence is not known. See In re Bell, 26 USPQ2d 1529, 1532 (Fed. Cir. 1993) and In re Deuel, 34 UPSQ2d, 1210 (Fed. Cir. 1995), which teach that the mere existence of a protein does not enable claims drawn to a nucleic acid encoding that protein. See also Amgen Inc. v. Chugai Pharmaceutical Co. Ltd., 18 USPQ2d 1016 at 1021 and 1027, (Fed. Cir. 1991) at page 1021, where it is taught that a gene is not reduced to practice until the inventor can define it by "its physical or chemical properties" (e.g. a DNA sequence), and at page 1027, where it is taught that the disclosure of a few gene sequences did not enable claims broadly drawn to any analog thereof.

Further, it is not clear how expression of the claimed DNA fragment can confer resistance to PPO-inhibiting herbicides upon all plants or plant cells, as it only encodes a portion of a protein, and the portion does not have PPO activity. While the portion of the protein would get expressed, the endogenous PPO that is sensitive to PPO-inhibiting herbicides would still get expressed. U.S. Patent No. 6,160,206 teaches the isolation of the same *Chlamydomonas* clone from the same *Chlamydomonas* strain, and indicates that a 3.4kb fragment, from which Xho/Pmac2.6 was derived, contains only a portion of the resistant gene, and the fragment must

integrate by homologous recombination into the herbicide-sensitive gene when introduced into a *Chlamydomonas* recipient, to confer resistance to PPO-inhibiting herbicides (col. 15, lines 29-34). The specification does not teach methods for gene targeting by homologous recombination for all plant cell types, and homologous recombination is not known to occur in all other plant species. Puchta (Plant Mol. Biol., 2002, Vol. 48, pages 173-182) discusses the state of gene replacement by homologous recombination in plants, and teaches that efficient gene targeting techniques in higher plants have not yet been achieved. Puchta teaches, for example, that improvements to gene targeting in animals have not been successful in plants (page 173), that extending the length of homology in the transferred DNA to up to 22 kb did not result in higher frequencies (page 174). Puchta discusses that results of gene targeting in Arabidopsis, involving the AGL5 MADS-box gene, have been controversial, and that no statistically sound conclusion as to the frequencies of targeting could be drawn from this single event (paragraph bridging pages 174-175). Terada et al. (Nature Biotech., 2002, Vol. 20, pages 1030-1034) also address the reports of gene targeting in Arabidopsis, and also assert that no one has yet repeated the experiments, and that the authors of one of those reports also detected the occurrence of undesirable events, including ectopic recombination and/or simultaneous ectopic integration of the transgene used (page 1030). While Terada et al. teach a method for homologous recombination in rice, it is noted that this method was not known at the time the instant invention was filed. As homologous recombination is required to practice the claimed method in all plant species, and that methods of gene targeting through homologous recombination were not known in the art for plant species other than Chlamydomonas at the time of the instant invention, undue experimentation would be required by one skilled in the art to use the claimed method to confer

resistance to PPO-inhibiting herbicides upon all plants or plant cells. See Genentech, Inc. V. Novo Nordisk, A/S, 42 USPQ2d 1001, 1005 (Fed. Cir. 1997), which teaches that "the specification, not the knowledge of one skilled in the art" must supply the enabling aspects of the invention. Given the breadth of the claims encompassing DNA fragments encoding parts of PPO proteins that have PPO activity, and a method of conferring resistance to PPO-inhibiting herbicides to all plant species or plant cells, unpredictability of the art and lack of guidance of the specification as discussed above, undue experimentation would be required by one skilled in the art to make and use the claimed invention.

Applicants argue, in the paper submitted 09 October 2002, that none of the previous Office Actions or the Advisory Action properly addressed the In re Wands factors (response, page 3, 1st full paragraph). However, while alleging that the Wands factors were not properly addressed, Applicants did not point out the supposed deficiencies of the rejections in the previous actions. Applicants also argue that in the amendment and reply After Final filed 05 July 2002, Applicants sufficiently addressed each of the Wands factors and have shown that a proper weighing of the Wands factors would reside in Applicants' favor (response, paragraph bridging pages 3-4). However, Applicants arguments presented in the paper filed 05 July 2002 were addressed in the Office action mailed 22 July 2002, and will not be repeated here.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

9. Claims 15, 16, 18, 21, and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Volrath et al. (U.S. Patent No. 5,939,602).

The claims are broadly drawn towards any isolated DNA fragment wherein said DNA fragment encodes a part of a protein, wherein said protein has protoporphyrinogen oxidase (PPO) activity in plants, and has a sequence that can be detected and isolated by DNA-DNA or DNA-RNA hybridization to any nucleic acid sequence that is complementary to a nucleotide sequence encoding SEQ ID NO: 1, and encodes the part of said protein in which the amino acid corresponding to Val13 of SEQ ID NO: 1 is substituted by another amino acid, and said DNA fragment has the ability to confer resistance to protoporphyrinogen-inhibiting herbicides in a plant or algal cells; or wherein said DNA fragment encodes a protein or part thereof having PPO activity in a dicot or monocot; or wherein said amino acid is methionine; or a plasmid comprising said DNA fragment.

Volrath et al. teach isolated plant DNA molecules that encode enzymes that have PPO activity in plants, wherein the enzyme has an amino acid sequence substitution at amino acid

position 390 in Table 1. That position in the amino acid sequences in Table 1 is valine. The amino acid substitution confers resistance to inhibitors of the PPO enzyme. This amino acid residue corresponds to Val13 of instant SEQ ID NO: 1. Volrath et al. teach plasmids containing the DNA molecules (claims; col. 35, line30 to col. 66, line 25). As Volrath et al. teach the DNA molecules encoding the complete proteins, DNA fragments that encode portions of the protein are also taught. The properties of hybridizing to nucleotide sequences encoding instant SEQ ID NO: 1 under the stated conditions, and conferring resistance to PPO-inhibiting herbicides in monocot, dicot, or algal cells when expressed therein, are inherent to the DNA fragments.

10. Claims 1, 2, 4, 6, 7, 10-16, 18, and 20-24 are rejected.

Contact Information

Any inquiry concerning this or earlier communications from the examiner should be directed to Ashwin Mehta, whose telephone number is 703-306-4540. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays from 8:00 A.M to 5:30 P.M. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson, can be reached at 703-306-3218. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 and 703-872-9306 for regular communications and 703-872-9307 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

December 24, 2002

ASHWIN D. MEHTA, PH.D
PATENT EXAMINER